

LISTING OF THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Claims:

1-76. (Canceled)

77. (Previously Presented) A method of acidizing a subterranean formation penetrated by a well bore comprising:

providing a permeability-modifying aqueous treatment fluid comprising:

a relative permeability modifier comprising a hydrophobically modified water-soluble polymer formed from:

a reaction comprising a hydrophilic polymer and a hydrophobic compound, wherein the hydrophobically modified water-soluble polymer formed from the reaction has a molecular weight in the range of about 100,000 to about 10,000,000, or

a polymerization reaction comprising a hydrophilic monomer and a hydrophobically modified hydrophilic monomer, wherein the hydrophobically modified water-soluble polymer formed from the polymerization reaction has a molecular weight in the range of about 250,000 to about 3,000,000,

wherein the hydrophobically modified water-soluble polymer comprises a polymer backbone comprising polar heteroatoms and a hydrophobic branch comprising an alkyl chain of about 4 to about 22 carbons, and

wherein the hydrophobically modified water-soluble polymer reduces the permeability of the subterranean formation to an aqueous-based fluid;

providing an acidizing treatment fluid;

injecting the permeability-modifying aqueous treatment fluid into the subterranean formation; and

injecting the acidizing treatment fluid into the subterranean formation.

78. (Original) The method of claim 77 wherein the permeability-modifying aqueous treatment fluid further comprises an aqueous-based fluid.

79. (Previously Presented) The method of claim 77 wherein the relative permeability modifier reduces the permeability of a zone of the subterranean formation to aqueous-based

fluids, thereby diverting the acidizing treatment fluid to another zone of the subterranean formation.

80. (Canceled)

81. (Previously Presented) The method of claim 77 wherein the polar heteroatoms present within the polymer backbone of the hydrophobically modified water-soluble polymer comprise at least one heteroatom selected from the group consisting of: oxygen, nitrogen, sulfur, and phosphorous.

82. (Previously Presented) The method of claim 77 wherein the hydrophobically modified water-soluble polymer is present in the permeability-modifying aqueous treatment fluid in an amount in the range of about 0.02% to about 10% by weight of the permeability-modifying aqueous treatment fluid.

83. (Previously Presented) The method of claim 77 wherein the hydrophobically modified water-soluble polymer is a reaction product of a hydrophilic polymer that comprises a polymer backbone comprising polar heteroatoms and a hydrophobic compound.

84. (Previously Presented) The method of claim 83 wherein the hydrophilic polymer comprises at least one polymer selected from the group consisting of: a cellulose, a polyamide, a polyetheramine, a polyhydroxyetheramine, a polysulfone, and a starch.

85. (Previously Presented) The method of claim 84 wherein the at least one polymer comprises the starch, wherein the starch comprises a cationic starch.

86. (Previously Presented) The method of claim 83 wherein the hydrophobic compound comprises at least one compound selected from the group consisting of: an alkyl halide, a sulfonate, a sulfate, and an organic acid derivative.

87. (Previously Presented) The method of claim 86 wherein the organic acid derivative comprises at least one organic acid derivative selected from the group consisting of: an octenyl succinic acid, a dodecenyl succinic acid, an anhydride of octenyl succinic acid, an ester of octenyl succinic acid, an amide of octenyl succinic acid, an anhydride of dodecenyl succinic acid, an ester of dodecenyl succinic acid, and an amide of dodecenyl succinic acid.

88-106. (Canceled)

107. (Original) The method of claim 77 wherein the permeability-modifying aqueous treatment fluid further comprises a gelling agent.

108. (Original) The method of claim 107 wherein the permeability-modifying aqueous treatment fluid further comprises proppant.

109. (Original) The method of claim 77 wherein the permeability-modifying aqueous treatment fluid is injected into the subterranean formation at a pressure sufficient to create or enhance at least one fracture therein.

110. (Original) The method of claim 77 wherein the acidizing treatment fluid is injected into the subterranean formation at a pressure sufficient to create or enhance at least one fracture therein.

111. (Original) The method of claim 77 wherein the permeability-modifying aqueous treatment fluid is injected into the subterranean formation prior to the acidizing treatment fluid.

112. (Original) The method of claim 77 wherein the permeability-modifying aqueous treatment fluid is injected into the subterranean formation simultaneously with the acidizing treatment fluid.

113-186. (Canceled)

187. (Previously Presented) A method of acidizing a subterranean formation penetrated by a well bore comprising:

providing a permeability-modifying aqueous treatment fluid comprising:

a relative permeability modifier comprising a hydrophobically modified water-soluble polymer formed from:

a reaction comprising a hydrophilic polymer and a hydrophobic compound, wherein the hydrophobically modified water-soluble polymer formed from the reaction has a molecular weight in the range of about 100,000 to about 10,000,000, or

a polymerization reaction comprising a hydrophilic monomer and a hydrophobically modified hydrophilic monomer, wherein the hydrophobically modified water-soluble polymer formed from the polymerization reaction has a molecular weight in the range of about 250,000 to about 3,000,000,

wherein the hydrophobically modified water-soluble polymer comprises a polymer backbone comprising polar heteroatoms and a hydrophobic branch comprising an alkyl chain of about 4 to about 22 carbons, and

wherein the hydrophobically modified water-soluble polymer reduces the permeability of a zone of the subterranean formation to an aqueous-based fluid;

providing an acidizing treatment fluid;

injecting the permeability-modifying aqueous treatment fluid into the subterranean formation; and

injecting the acidizing treatment fluid into the subterranean formation so that the hydrophobically modified water-soluble polymer present in the subterranean formation diverts the acidizing treatment fluid to another zone of the subterranean formation.

188. (Previously Presented) The method of claim 187 wherein the permeability-modifying aqueous treatment fluid further comprises an aqueous-based fluid.

189. (Canceled)

190. (Previously Presented) The method of claim 187 wherein the polar heteroatoms present within the polymer backbone of the hydrophobically modified water-soluble polymer comprises at least one heteroatom selected from the group consisting of: oxygen, nitrogen, sulfur, and phosphorous.

191. (Previously Presented) The method of claim 187 wherein the hydrophobically modified water-soluble polymer is present in the permeability-modifying aqueous treatment fluid in an amount in the range of about 0.02% to about 10% by weight of the permeability-modifying aqueous treatment fluid.

192. (Previously Presented) The method of claim 187 wherein the hydrophobically modified water-soluble polymer is a reaction product of a hydrophilic polymer that comprises a polymer backbone comprising polar heteroatoms and a hydrophobic compound.

193. (Previously Presented) The method of claim 192 wherein the hydrophilic polymer comprises at least one polymer selected from the group consisting of: a cellulose, a polyamide, a polyetheramine, a polyhydroxyetheramine, a polysulfone, and a starch.

194. (Previously Presented) The method of claim 193 wherein at least one polymer comprises the starch, wherein the starch comprises a cationic starch.

195. (Previously Presented) The method of claim 192 wherein the hydrophobic compound comprises at least one compound selected from the group consisting of: an alkyl halide, a sulfonate, a sulfate, and an organic acid derivative.

196. (Previously Presented) The method of claim 195 wherein the organic acid derivative comprises at least one organic acid derivative selected from the group consisting of: an octenyl succinic acid, a dodecenyl succinic acid, and an anhydride of octenyl succinic acid, an ester of octenyl succinic acid, an amide of octenyl succinic acid, an anhydride of dodecenyl succinic acid, an ester of dodecenyl succinic acid, and an amide of dodecenyl succinic acid.

197. (Canceled)

198. (Previously Presented) The method of claim 187 wherein the permeability-modifying aqueous treatment fluid further comprises a gelling agent.

199. (Previously Presented) The method of claim 198 wherein the permeability-modifying aqueous treatment fluid further comprises proppant.

200. (Previously Presented) The method of claim 187 wherein the permeability-modifying aqueous treatment fluid is injected into the subterranean formation at a pressure sufficient to create or enhance at least one fracture therein.

201. (Previously Presented) The method of claim 187 wherein the acidizing treatment fluid is injected into the subterranean formation at a pressure sufficient to create or enhance at least one fracture therein.

202. (Previously Presented) The method of claim 187 wherein the permeability-modifying aqueous treatment fluid is injected into the subterranean formation prior to the acidizing treatment fluid.

203. (Previously Presented) The method of claim 187 wherein the permeability-modifying aqueous treatment fluid is injected into the subterranean formation simultaneously with the acidizing treatment fluid.

204. (Previously Presented) The method of claim 77 wherein the polar heteroatoms comprise at least one heteroatom selected from the group consisting of: oxygen, sulfur, and phosphorous.

205. (Previously Presented) The method of claim 187 wherein the polar heteroatoms comprise at least one heteroatom selected from the group consisting of: oxygen, sulfur, and phosphorous.

206. (Previously Presented) A method of acidizing a subterranean formation penetrated by a well bore comprising:

providing a permeability-modifying aqueous treatment fluid comprising:

a relative permeability modifier comprising a hydrophobically modified water-soluble polymer that comprises a polymer backbone and a hydrophobic branch, the hydrophobic branch comprising an alkyl chain of about 4 to about 22 carbons and the polymer backbone comprising polar heteroatoms wherein the polar heteroatoms comprise at least one heteroatom selected from the group consisting of: oxygen, sulfur, and phosphorous, wherein the hydrophobically modified water-soluble polymer reduces the permeability of the subterranean formation to an aqueous-based fluid;

providing an acidizing treatment fluid;

injecting the permeability-modifying aqueous treatment fluid into the subterranean formation; and

injecting the acidizing treatment fluid into the subterranean formation.

207. (Previously Presented) The method of claim 206 wherein the permeability-modifying aqueous treatment fluid further comprises an aqueous-based fluid.

208. (Previously Presented) The method of claim 206 wherein the relative permeability modifier reduces the permeability of a zone of the subterranean formation to aqueous-based fluids, thereby diverting the acidizing treatment fluid to another zone of the subterranean formation.

209. (Previously Presented) The method of claim 206 wherein the hydrophobically modified water-soluble polymer is present in the permeability-modifying aqueous treatment fluid

in an amount in the range of about 0.02% to about 10% by weight of the permeability-modifying aqueous treatment fluid.

210. (Previously Presented) The method of claim 206 wherein the hydrophobically modified water-soluble polymer is a reaction product of a hydrophilic polymer that comprises a polymer backbone comprising polar heteroatoms and a hydrophobic compound.

211. (Previously Presented) The method of claim 210 wherein the hydrophilic polymer comprises at least one polymer selected from the group consisting of: a cellulose, a polyamide, a polyetheramine, a polyhydroxyetheramine, a polysulfone, and a starch.

212. (Previously Presented) The method of claim 211 wherein the at least one polymer comprises the starch, wherein the starch comprises a cationic starch.

213. (Previously Presented) The method of claim 210 wherein the hydrophobic compound comprises at least one compound selected from the group consisting of: an alkyl halide, a sulfonate, a sulfate, and an organic acid derivative.

214. (Previously Presented) The method of claim 213 wherein the organic acid derivative comprises at least one organic acid derivative selected from the group consisting of: an octenyl succinic acid, a dodecenyl succinic acid, an anhydride of octenyl succinic acid, an ester of octenyl succinic acid, an amide of octenyl succinic acid, an anhydride of dodecenyl succinic acid, an ester of dodecenyl succinic acid, and an amide of dodecenyl succinic acid.

215. (Previously Presented) The method of claim 206 wherein the permeability-modifying aqueous treatment fluid further comprises a gelling agent.

216. (Previously Presented) The method of claim 215 wherein the permeability-modifying aqueous treatment fluid further comprises proppant.

217. (Previously Presented) The method of claim 206 wherein the permeability-modifying aqueous treatment fluid is injected into the subterranean formation at a pressure sufficient to create or enhance at least one fracture therein.

218. (Previously Presented) The method of claim 206 wherein the acidizing treatment fluid is injected into the subterranean formation at a pressure sufficient to create or enhance at least one fracture therein.

219. (Previously Presented) The method of claim 206 wherein the permeability-modifying aqueous treatment fluid is injected into the subterranean formation prior to the acidizing treatment fluid.

220. (Previously Presented) The method of claim 206 wherein the permeability-modifying aqueous treatment fluid is injected into the subterranean formation simultaneously with the acidizing treatment fluid.